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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,447	08/28/2001	Patrick B. Halahan	M-9999-1D US	7110
32605	7590	04/09/2004	EXAMINER	
MACPHERSON KWOK CHEN & HEID LLP 1762 TECHNOLOGY DRIVE, SUITE 226 SAN JOSE, CA 95110			THOMAS, TONIAE M	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 04/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/941,447

Applicant(s)

HALAHAN ET AL.

Examiner

Toniae M. Thomas

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 20-22 and 30-80 is/are pending in the application.
- 4a) Of the above claim(s) 36-38, 48-51 and 71-74 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-22, 63-70 and 75-80 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 8, 9, 30-32, 39-41, 52, 60 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 6, 7, 10-12, 33-35, 42-47, 53-59, 61 and 62 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/10/03, 10/06/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is responsive to the election filed on 13 January 2004.

Currently, claims 1-12, 20-22, and 30-80 are pending.

Election/Restrictions

2. Applicant's election without traverse of the species of Group I in the election filed on 13 January 2004 is acknowledged. Claims 36-38, 48-51, and 71-74 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 5, 8, 9, 30-32, 39-41, 52, and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Hisamoto et al. (US 5,246,877).

The Hisamoto et al. patent (Hisamoto) discloses a circuit manufacturing method (figs. 4A-4G and accompanying text). The method comprises: providing a structure in which an opening 23 extends into a first side of a semiconductor substrate having a second side opposite the first side such that the opening penetrates partway through the substrate (fig. 4C), a plurality of conductive layers overlay one another in the

opening, and the conductive layers include a first conductive layer 30a and a second conductive layer 24 overlaying the first conductive layer such that the first and second conductive layers are separated by insulating material 2 in the opening (fig. 4E); and removing material along the second side of the substrate to reach the opening and expose the second conductive layer from the second side of the substrate (fig. 4F).

The first conductive layer comprises a doped region 30b of the semiconductor substrate occupying at least a portion of the sidewalls of the opening (fig. 4D).

Removing material along the second side of the substrate comprises mechanical removal of the material (fig. 4F and col. 3, lines 61-65). The second conductive layer 24 is exposed in the opening from the second side of the substrate during the mechanical removal of the material, wherein the mechanical removal of the material comprises chemical mechanical polishing (fig. 4F and col. 3, lines 61-65).

The first conductive layer substantially laterally surrounds the insulating layer in the opening, and the insulating layer substantially surrounds the second conductive layer in the opening (fig. 4E).

Removing material along the second side of the substrate comprises: removing material of the substrate from its second side; and removing material of the first conductive layer exposed from the second side of the substrate (fig. 4F).

Removing material along the second side of the substrate comprises: removing material of the substrate from its second side and including material of the first conductive layer situated in the opening, removing material underlying the second

conductive layer, and exposed from the second side of the substrate so as to expose the second conductive layer from the second side of the substrate (fig. 4F).

Subsequent to removing material along the second side of the substrate, the opening is wider along the first side of the substrate than along its second side (fig. 4E).

Allowable Subject Matter

5. Claims 20-22, 63-70, and 75-80 are allowable. The prior art of record does not anticipate, teach or suggest a method for manufacturing a circuit, wherein the method comprises forming at least three conductive layers overlying one another in an opening, which penetrates partway through the first side of a substrate, such that each consecutive pair of the conductive layers (i) are separated by insulating material in the opening, or (ii) form a P-N junction in the opening, or (iii) form a Schottky junction in the opening; and removing material along the second side of the substrate to reach the opening and expose at least one of the conductive layers from the second side of the substrate.

6. Claims 3, 4, 6, 7, 10-12, 33-35, 42-47, 53-59, 61, and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MMJ

05 April 2004



Mary Wilczewski
Primary Examiner